



Calgon Carbon Corporation Integrated Systems

Provide Groundwater Solutions

Calgon Carbon Corporation



For the Treatment of Perchlorate, MtBE, NDMA, Nitrate, 1,4-Dioxane, H₂S, Iron, Disinfection By-products, Microbial Pathogens and Chlorinated Hydrocarbons

WATER TREATMENT NEEDS

An increasing number of groundwater aquifers have been contaminated by the presence of small amounts of potentially toxic substances such as N-nitrosodimethylamine (NDMA), perchlorate (ClO₄⁻), MtBE and 1,4-dioxane. In addition to these lesser-known substances, contaminants such as nitrate (NO₃⁻), iron, H₂S and chlorinated hydrocarbons (including TCE, PCE, CCl₄ and TCA) are of concern to the drinking water community. Bacteria, viruses and other microbial pathogens—such as Cryptosporidium and Giardia—taste and odor, and pesticides, can also be a problem.

Some of these potentially toxic substances are of great concern—even at extremely low concentrations—and must be reduced to the parts per

trillion (ppt or ng/L) level to meet various regulatory requirements. California, for example, has established action levels of 2 ppt for NDMA and 18 ppb for perchlorate. Meeting these treatment requirements has been made more challenging by the presence of a complex mixture of difficult-to-treat contaminants.

Until recently, there wasn't any one company that could provide a system capable of treating multicomponent contamination, attaining the high degree of purification required for regulatory compliance.

Now with the introduction of Calgon Carbon Corporation's Integrated Systems, there is a treatment system that offers a comprehensive solution from a single source.

CUSTOMIZED

Calgon Carbon Corporation's Integrated Systems are modular in design, consisting of one or more technologies, dependent upon and customized to meet specific customer requirements. They are especially effective if your groundwater has a mixture of contaminants including one or more of the following:

- NDMA
- Perchlorate
- MtBE
- Nitrate
- Iron
- Microbial pathogens (bacteria, viruses, Crypto and Giardia)
- Disinfection by-products
- Taste and odor
- Chlorinated hydrocarbons (TCE/PCE/TCA/CCl₄)

System Features Include:

- Patented modules
 - Rayox® Tower
 - ISEP®
 - Model 8, 10, 12 GAC Systems
 - Sentinel™ UV Disinfection
- Fully automated PLC system control
- Safety interlock switches
- Magnetic flow meters
- Integrated design and manufacturing



CALGON CARBON CORPORATION

FOR MORE INFORMATION, CALL 800-422-7266

Brussels, Belgium Lakeland, FL, USA Pittsburgh, PA, USA Toronto, Canada Vero Beach, FL, USA

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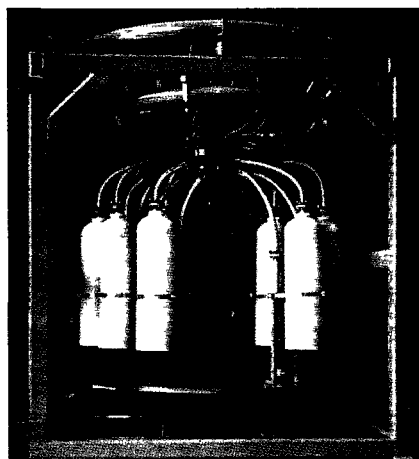
SOLUTION

Integrated Systems from Calgon Carbon Corporation, the world leader in ground-water purification systems, are specifically designed to treat groundwater contaminated with extremely complex mixtures of contaminants including: perchlorate, NDMA, MtBE, nitrate, dioxane, H_2S , iron, disinfection by-products, microbial pathogens, and chlorinated hydrocarbons.

Integrated Systems employ Calgon Carbon Corporation's leading expertise in multiple technologies—activated carbon, ultraviolet (UV) disinfection, advanced oxidation, and continuous ion exchange.

Since 1983, Calgon Carbon Corporation has built more than 1,000 systems for the treatment of a variety of contaminants including chlorinated hydrocarbons, MtBE, NDMA, nitrate and dioxane. The flow rates of these treatment systems range from 3-5 GPM to

58,000 GPM (80 MGD). Discharge requirements for these systems frequently are non-detect, which for some substances is in the low ppt range.

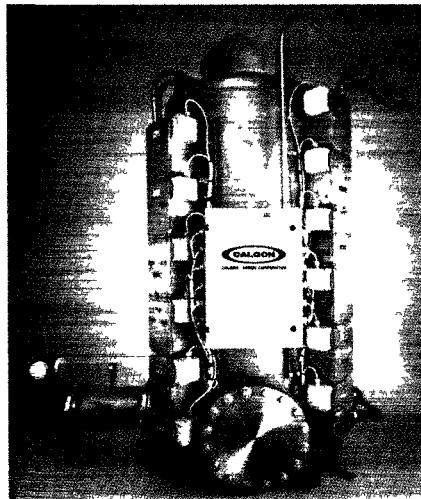


ISEP Module

*System Dimensions 150" H x 120" W
Flow Rate 350 GPM*

ISEP® Continuous Ion-exchange module

- Perchlorate
- Nitrate



Rayox Tower Module

*Tower Dimensions 88" L x 68" W x 122" H
Power Supply 105" L x 49" W x 88" H
Flow Rate 3,000 GPM*

Rayox® Tower UV/Oxidation module

- NDMA
- 1,4-dioxane
- MtBE
- Chlorinated hydrocarbons

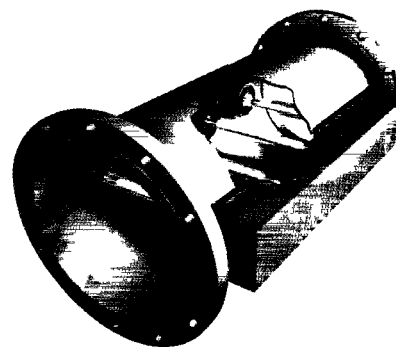


Model 10 Module

*System Dimensions 282" L x 90" W x 264" H
Flow Rate 1,000 GPM*

Model 10 Granular Activated Carbon (GAC) module

- Iron
- H_2S
- Taste and odor
- Disinfection by-products
- Chlorinated hydrocarbons



Sentinel UV Disinfection Module

*4 x 4 kW System Dimensions 36" L x 24" W
Flow Rate 5,560 GPM*

Sentinel™ System UV Disinfection

- Protozoans (Cryptosporidium parvum, Giardia)
- Viruses
- Bacteria

SAMPLE INSTALLATION

La Puente Valley County Water District
La Puente, California

- **Flow Rate:** 2,500 GPM
- **Influent:** Perchlorate - 200 ppb
N-nitrosodimethylamine (NDMA) - 900 ppt
- **Effluent:** Perchlorate - <5 ppb
N-nitrosodimethylamine (NDMA) - <5 ppt
- **Modules:** ISEP® - for perchlorate removal
Rayox® Tower - for NDMA removal
- **Footprint:** 2,400 sq. ft.



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e-mail: paxton@calgoncarbon.com www.calgoncarbon.com

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